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Water Stress and a Changing San Joaquin Valley

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Summary

The San Joaquin Valley—California’s largest agricultural region, and an important contributor to the nation’s food supply—is in a time of great change and growing water stress. Agriculture is a leading economic driver and the predominant water user. The region’s farms and related manufacturing businesses account for 25 percent of the valley’s revenues and 16 percent of local jobs—and 89 percent of annual net water use.

The latest drought underscored valley agriculture’s vulnerability to water scarcity and long-term declines in groundwater reserves. The region has a greater abundance of productive farmland than local water supplies for irrigation. In most years since the mid-1980s, groundwater has been used faster than it is being replenished (“groundwater overdraft”). Over the past three decades, overdraft has averaged nearly 2 million acre-feet per year, or 13 percent of net water use. This has contributed to increased pumping costs, dry wells, sinking lands, and declining reliability of this vital drought reserve.

The Sustainable Groundwater Management Act of 2014 (SGMA) requires valley farms and communities to bring their groundwater basins into balance by 2040. Farms must also respond to a variety of related resource and environmental challenges. Notable issues include nitrate contamination of groundwater—a special challenge in poor, rural communities—as well as accumulating salinity in soils, local air pollution, and the broad decline in aquatic, wetland, and terrestrial ecosystems.

With so many changes underway, major questions loom about the future of the valley’s agriculture and the wider consequences for the region’s economy, society, and environment. Several broad strategies can help address the valley’s water imbalance and related problems:

- **Manage groundwater reserves:** Groundwater sustainability agencies being formed under SGMA will need solid water accounting tools to understand how much water is available and how much is being withdrawn. They will also need the ability to incentivize both recharge and reductions in pumping to attain long-term groundwater balance.
- **Expand usable supplies:** Capturing and storing more local runoff in groundwater basins and reusing water would help reduce the current deficit in the near term. Longer term, larger infrastructure investments such as improved water conveyance from the Delta could help.
- **Reduce demand:** Although farmers can save some water through crop choice and management, idling some farmland is also likely in basins that cannot close the groundwater deficit with new supplies. Water trading—both within and across basins—can lessen the costs of shortages.
- **Explore multi-benefit strategies:** Opportunities exist to manage groundwater recharge in ways that improve water supply and quality—for example, by tailoring irrigation systems and crop choices to maximize clean recharge in prime areas. Similarly, with the right incentives and regulatory assurances, idled lands can be managed to reduce impacts on air quality while improving wildlife habitat.

Valley farmers and residents have a history of creatively adapting to changing conditions. In meeting today's challenges, there are numerous opportunities to tackle problems cooperatively. But the valley also has a complex mix of entities and institutions managing water and land. Perhaps one of the region's greatest challenges is developing new cooperative approaches to seize these opportunities. The entire region—and California as a whole—will benefit if solutions to the valley's problems support the economy while improving public health and environmental conditions.

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